INDEX TO VOLUME VIII.*

A

Acetylene, *Blochmann*, 59.
condensation of, by silent electric discharge, 61.
Acoustics, researches in, *Mayer*, 81, 170, 241, 362.
Adhesion, apparent, 137.
Agassiz, A., notice of papers on embryology by Kowalevsky, 470.
on Hæckel's Gastræa theory, 472.
Revision of Echini, noticed, 72.
Embryology of Ctenophoræ, noticed, 471.
Agassiz and Pourtales, Results of Hassler Expedition, noticed, 72.
Alcohol, table of dilution of, 401.
Andrews, E. B., parallelism of coal-seams, 56.
Allen, J. A., metamorphic products from burning of coal-beds, noticed, 141.
Allyl series, nitro-compounds of, 62.
Association, American, Hartford meeting, 235.
American, presidential address, 297.
French, 160.
Amyl alcohol, 383.
Antimony blue, 132.
Archæology and Ethnology, Peabody Museum of, Report, noticed, 158.
Armsby, H. P., on decay of nitrogenous organic substances, 337.
Aspirator, jet, *Richards*, 412.
Audition, *Mayer*, 81, 248.
Aurora, in Vermont, *Wing*, 157.

B

Bahamas, physical geography and mollusca, 231.
Baird, S. F., Record of Science and Industry, noticed, 80.
Ballardi, L., on Tertiary mollusks, noticed, 394.
Baker, J. G., on Tulipeæ, noticed, 320.
Barometric gradient and velocity of wind, *Ferrel*, 343.
Barcena, M., on livingstonite, noticed, 145.
Barker, G. F., chemical abstracts, 59, 132, 309, 382.
Basarow, fluoxyboric acid, 309.
Belcher, G. R., maps of geyser basins, noticed, 146.
Bel, Le, preparation of active amyl alcohol, 383.
Besanez, G., leucin in vetch, 134.
Benzol, first products of distillation, 382.
Billings, E., Palæozoic Fossils, noticed, 319.
Blake, J. M., diffraction gratings, 33.
Blake, W. P., wood tin in Georgia, 390.
Bland, T., physical geography and distribution of terrestrial mollusca of the Bahamas, noticed, 231.
Blockmann, acetylene, 59.
Blodget, L., American Meteorology, noticed, 399.
Bogardus, E. H., on iron ores containing phosphoric acid, 334.
Boltzmann, M. L., dielectricity of insulators, 210.
Boricky, E., on phonolytes, noticed, 394.
Börtzell, A., on geological charts, noticed, 394.
BOTANY—
Carex, perigynium and seta in, 70.
Carnivorous habits of plants, 395.
Cyclosis, use of, 469.
Physiological groups, 147.
Pteris, Farlow on asexual growth from prothallus of, 321.
Trees, influence of climate and topography on, 71.
Vegetation, changes produced in by sheep-grazing, 69.
Wilkes' Exploring Expedition, noticed, 321.
Zizania aquatica for paper material, 321.
See further under GEOLOGY.
Brackebusch, nitro-compounds of allyl series, 62.
Bradley, F. H., recent earthquakes in North Carolina, 79.
metamorphic Silurian rocks in North Carolina, 388.
Brocklesby, J., periodicity of rainfall in U. S. in relation to solar spots, 439.
Brush, G. J., note on J. L. Smith's Memoirs, 144, 240.
Buffalo Society Nat. Sci., Bulletin, noticed, 146.
Burnham, W. A., magnetism in soft iron on reversal of current, 202.

* The Index contains the general heads Botany, Geology, Mineralogy, Zoology, and under each the titles of Articles referring thereto are collected.

C

Calculating machine, new, *Grant*, 277.
Capillary tubes, flow of saline solutions through, 211.
Carney, E. L., effect of longitudinal vibrations upon electro-magnets, 203.
Carter, H. J., on sponges, noticed, 478.
Casin, magnetic equivalent of heat, 463.
Chase, A. W., habits of wood-rat, 73.
Chase, P. E., velocity of primitive undulation, 366.
Chemical centennial, 80, 239.
Cincinnati Journal of Science, 404.
Clarke, F. W., molecular heat of similar compounds, 340.
molecular volume of water of crystallization, 428.
Coan, T., coral reefs of Hawaii, 466.
Hawaiian volcanoes, 467.
Cobalt, hexatomic compounds of, *Gibbs*, 189, 284.
Colorado School of Mines, 322.
Comet, Coggia's, 78, 156.
spectrum of, 398.
Conductivity, unilateral, 464.
Contractional hypothesis, *Dutton*, 113.
Cooke, J. P., note to monograph on vermiculites, 139.
Cooper, I. G., influence of climate and topography on trees, noticed, 71.
Cope, E. D., fishes of Utah, noticed, 146.
Coral reefs, notes on Darwin's work, *Dana*, 312.
of Hawaii, 466.
Couple, copper-zinc, action of, 311,
Cox, E. S., geological report, noticed, 319.
Croce-Spinelli and *Sivel*, aqueous lines in solar spectrum, 136.
Croll, J., cause of ocean-currents, 228.
Crookes, repulsion due to heat, 62.

D

Dana, E. S., on datolite, 68.
on atacamite, 69.
trap rocks of Connecticut Valley, 390.
and *A. Schrauf*, thermo-electric properties of minerals, 255.
Dana, J. D, changes in subdivisions of geological time in Manual of Geology, 213.
coal of Carboniferous age, 216.
notes on Darwin's work on coral reefs, 312.
serpentine pseudomorphs, etc., from Tilly Foster Iron Mine, 371, 447.
coral reefs of Hawaii. 466.
Manual of Geology, noticed, 67.
correction, 323.
Darwin, C., work on coral reefs, notes on, *Dana*, 312.
Dawson, G. M., lignitic north of the parallel of 49°, noticed, 142.
Dawson, J. W., on marine Champlain north of Lake Superior, and on climate of Champlain period, noticed, 143.
vegetable paleontology, noticed, 151.
Permian in Nova Scotia, noticed, 469.
DeCandolle, A., on physiological groups in vegetable kingdom, noticed, 147.
Decay of nitrogenous organic substances, *Armsby*, 337.
Dielectricity of insulators, 210.
Diffraction gratings, *Blake*, 33.
Domeyko, Don I., Chilian mineralogy, noticed, 145.
Dutton, C. E., criticism upon the contractional hypothesis, 113.

E

Earthquakes, recent in North Carolina, *Bradley*, 79.
Earthquake, von Seebach, 455.
at Aachen, Lasaulx on, 392.
Earth's axial rotation, variability of, *Newcomb*, 161.
Electrical currents through iron and steel bars, molecular change produced by, *Trowbridge*, 18.
Electrical phenomena, 387.
Electric discharge, composite nature of, *Mayer*, 336.
Electricity, dissipation of, by flames, *Fawkes*, 207.
frictional, 139.
Electro-magnets, effect of vibrations upon, *Carney*, 203.
Emerson, B. K., review of von Seebach's earthquake of March 6, 1872, 455.
Erdmann, E., on the Carboniferous of Scania, noticed, 394.
Eucalyptol, 59.
Evaporation, forces caused by, 385.

F

Faust and *Homeyer*, eucalyptol, 59.
Fawkes, J. W., dissipation of electricity by flames, 207.
Ferrel, W., barometric gradient and velocity of wind, 343.
Fluoxyboric acid, 309.
Foster, M., Physiology, noticed, 478.
Forbes, G., Transit of Venus, noticed, 478.
Franklin Institute, Journal, noticed, 403.
Franz-Joseph Land, 401, 478.
Fusion, change of volume by, 212.
Fusion of metals, 387.

G

Gas analysis, *Hinman*, 182.
Gabb, W. M., geology of Costa Rica, 388.

Gardner, J. T., map of central Colorado, noticed, 400.
Geinitz, H. B., Das Elbthalgebirge in Sachsen, noticed, 394.
Geological Report, Canada, noticed, 319.
Hokkaido, 158.
Indiana, 319.
Territories, 469.
West of 100th meridian, 80, 468.
Yesso, 221.
Geological Survey, Georgia, 394.
Italy, 144, 395.
Pennsylvania, 67.
Sweden, 395.
Geological time, changes in sub-divisions of, *Dana*, 213.
GEOLOGY—
Anomalodonta identical with Megaptera, 218.
Archæan, in Putnam Co., New York, *Dana*, 371.
Cardiocarpus, winged fruit of, 216.
Champlain north of Lake Superior, and climate of, 143.
Coal-beds, metamorphic products from burning of, 141.
Coal in Cretaceous of Minnesota, 67.
Coal, not made of bark, 216.
Coals, ash of American, 216.
Coal-seams, parallelism of, *Andrews*, 56.
Coral reefs, Niagara, 219.
Costa Rica, *Gabb*, 388.
Drift in Kansas, 466.
Elephant and Mastodon in California, 143.
Gold Hill mining region, *Marvine*, 29.
Helderberg rocks in New Hampshire, 68.
Lignitic north of 49°, 142.
of Rocky Mts., *Meek*, 459.
Mammals, brain in Tertiary, *Marsh*, 66.
Metamorphic Silurian rocks in North Carolina, 390.
Permian in Nova Scotia, 469.
Quaternary in New Brunswick, 219.
Superior, Lake, *Irving*, 46.
Plants, land, from Lower Silurian, *Newberry*, 110, 160.
Plants, Carboniferous, in the Alps, 218.
Tin-bearing country, 403.
Trap, fossils in, 219.
Trap rocks of Connecticut Valley, *Dana*, 390.
Genth, F. A., reply to Hunt, 221.
Gibbs, W., hexatomic compounds of cobalt, 189, 284.
Gladstone and *Tribe*, action of copper-zinc couple on chlorides of ethylene and ethylidene, 311.
Glasenapp on variability of earth's axial rotation, 161.
Goode, G. B., fishes from Bermuda, 123.
Gould, B. A., number and distribution of fixed stars, 325.
Grant, G. B., calculating machine, 277.
Gray, A., botanical notices, 69, 147, 320, 395, 469.
botanical contributions, noticed, 70.
Great Salt Lake, change of level in, 226.
Gunther, A., on tortoises of Mauritius and Galapagos, noticed, 403.

H

Hæckel's Gastræa theory, 472.
Hall, J., on Goniatidæ, noticed, 220.
Hartt, C. F., and Derby, O. A., Bulletin of the Cornell University, noticed, 144.
Hartwig, compounds of thallium with alcohol radicals, 60.
Hawes, G. H., analysis of serpentine pseudomorph, 451.
examination of brucite, 453.
Heat, magnetic equivalent of, 463.
molecular, of similar compounds, *Clarke*, 340.
repulsion due to, 62.
specific, of gases, 465.
Helbing, first products of distillation of benzol, 382.
Henshaw, H. W., birds of Utah, noticed, 146.
Himes, C. F., preparation of photographic dry-plates by daylight, 16.
chemical works, noticed, 140.
Hinman, C. W., new apparatus for gas analysis, 182.
Holden, E. S., and *S. Newcomb*, periodic changes in sun's apparent diameter, 268.
Honeyman, D., Quaternary containing fossil cetacean, Niagara coral reefs, fossils in trap, 219.
Hübener, M. T., flow of saline solutions through capillary tubes, 211.
Huggins, W., motions of some of the nebulæ, 75.
spectrum of Coggia's comet, 398.
Hunt, T. S., reply of Genth to, 221.
Hydrogenium, alloys of, 132.

I

Ice, permanent in Rocky Mts., 477.
Iron ores containing phosphoric acid, on, *Bogardus*, 334.
Irving, R., copper-bearing rocks of Lake Superior, 46.

J

Joulin, M. L., frictional electricity, 139.

K

Kingzett, ozone not produced by oxidation of essential oils, 310.

Knox, M. V. B., drift in Kansas, 466.
Kohlrausch, expansion of hard rubber, 384.
Kolbe, preparation of salicylic acid, 383.
Kowalevsky, A., notice of papers on embryology by, 470.
Krauss, antimony blue, 132.

L

Lactic acid of the allyl series, 134.
Lakes, the Great, fluctuations in 80.
Lasaulx, A. von, on earthquake, noticed, 392.
Leidy J., enemies of Difflugia, revivification of rotifer, 223.
new rhizopods, 224.
Leucin in vetch, 134.
Linnean Society, 397.
Loomis, E., results from examination of U. S. weather maps, 1.
Lovering J., mathematical and philosophical state of physical sciences, 297.
Lovet, spectroscope with fluorescent eyepiece, 64.
Lyman, B. S., geological report, noticed, 221.

M

Magnetic observatory in China, 159.
Magnetism, effect of, on electric discharge in rarefied gases, 138.
in soft iron, *Burnham*, 202; *Sears*, 21.
Mallet, R., volcanic energy, 140.
change of volume by fusion, 212.
mechanism of Stromboli, 200.
Marianini, electrical phenomena, 387.
Marsh, O. C., brain in Tertiary mammals, 66.
Marvine, A. P., Gold Hill mining region, 29.
Maximowicz, Diagnoses Plantarum Japoniæ, noticed, 70.
Maxwell, double refraction of viscous fluid in motion, 63.
Mayer, A. M., researches in acoustics, 81, 170, 241, 362.
method of investigating composite nature of electric discharge, 336.
Meek, F. B., age of Lignitic formation of Rocky Mts., 459.
Meteoric iron from Peru, 398.
Meteorites, 399.
Meteorology, American, 399.
of Havana, noticed, 401.
Miescher, protamine, new base from spermatozoids of salmon, 135.
Mineralogical collection of Dr. Troost, 319.
MINERALS, ETC.—
Atacamite, *Dana*, 68.
Brucite pseudomorphs, 449, 453.
MINERALS, ETC.—
Biotite, pseudomorphs after, 449.
Calcite, pseudomorphs after, 379.
Chlorite, pseudomorphs after, 381.
Chondrodite, pseudomorphs after, 447. 455, 456.
Datolite, *Dana*, 68.
curious association of, 434.
Dolomite, pseudomorphs after, 449, 453, 456.
Enstatite, pseudomorphs after, 448.
Garnet, curious association of, *Smith*, 434.
Hornblende, pseudomorphs after, 448.
Idocrase, curious association of, 434.
Livingstonite, 145.
Magnetite pseudomorphs, *Dana*, 454.
Pyrrhotite pseudomorphs, *Dana*, 456.
Serpentine pseudomorphs, from Tilly Foster Iron Mine, *Dana*, 371, 447.
Tin, wood, in Georgia, 390.
Trap rocks of Connecticut valley, *Dana*, 390.
Vermiculites, note to monograph on, *Cooke*, 139.
Veszelyte, 145.
Warwickite, *Smith*, 432.
Minerals, thermo-electric properties of, *Schrauf* and *Dana*, 252.
Moffat, T., sun-spot and atmospheric ozone, 477.
Mojsvar, E. M. von, geological work, noticed, 68.
Molecular heat of similar compounds, *Clarke*, 340.
Morey, C. A., phonautograph, 130.
Munroe, H. S., geological report, noticed, 158.
Musical harmony, *Mayer*, 252.
note, curve of, *Mayer*, 177.

N

Nebulæ, motions of, *Huggins*. 75.
Newberry, J. S., land plants from the Lower Silurian, 110, 160.
New York, museum of natural history, 78.
Newcomb, S., and *E. S. Holden*, periodic changes in sun's apparent diameter, 268.
Newcomb, S., variability of the earth's axial rotation, 161.
Nitrogenous organic substances, decay of, *Armsby*, 337.

O

OBITUARY—
Beaumont, Elie de, 404.
Hessenberg, Friedrich, 404.
Meissner, C. F., 72.
Shuttleworth, Robert, 155.
Wyman, Jeffries, 323.

Observatory, Cordoba, 78.
in Sierra Nevada, 78.
Ocean-currents, cause of, 228.
Ocean's bed between Honolulu and Yokohama, 234.
Oxford, chair of geology at, 160.
Ozone, and sun-spot, 477.
not produced by oxidation of essential oils, 310.

P

Packard, A. S., Jr., work on insects, noticed, 323.
Record of Entomology, noticed, 395.
Paris, Academy of Sciences, 160.
Pengelly, W., exploration of Brixham cave, noticed, 68.
Perrey, A., on earthquakes, noticed, 159.
Phillips, J. A., Metallurgy, noticed, 240.
Phonautograph, *Morey*, 130.
Phosphoric acid, on iron ores containing, *Bogardus*, 334.
Photographic dry-plates, preparation of by daylight, *Himes*, 16.
Physical sciences, mathematical and philosophical state of, *Lovering*, 297.
Pickering, E. C., physical notices, 62. 137, 210, 384, 463.
Pigment, blue, of the Egyptians, 159.
Pinner, lactic acid of allyl series, 134.
Planet, new, 78.
Polarization of metallic surfaces, 65.
of plates of condensers, *Thayer*, 208.
Protamine, new base from spermatozoids of salmon, 135.
Pseudomorphs, serpentine, etc., from Tilly Foster Iron mine, *Dana*, 371, 447.

Q

Quincke, M. G., polarization of metallic surfaces, 65.

R

Rainfall and solar spots, *Brocklesby*, 439.
Rath, G. vom, mineralogical contributions, noticed, 319.
Refraction, double, of viscous fluid in motion, 63.
Refraction of liquids, index of, 386.
Renevier, E., Tableau des Terrains Sedimentaires, noticed, 400.
Reynolds, O., forces caused by evaporation from a surface, 385.
Richards, R. H., jet aspirator for chemical and physical laboratories, 412.
Riley, C. V., Entomological report, noticed, 322.
Rive, De La, and *Sarasin*, effect of magnetism on electric discharge in rarefied gases, 138.
Roiti, M. A., electrical phenomena, 387.
Rood, O. N., optical method of studying the vibrations of solid bodies, 126.
Rose, G., meteoric iron from Peru, 398.
Rubber, expansion of hard, 384.

S

Salicylic acid, 383.
Schmidt, A., Mallet's view of fusion of metals, 387.
Schrauf, A., and *E. S. Dana*, thermo-electric properties of minerals, 252.
Schrauf, A., on veszelyte, noticed, 145
Schuster, A., unilateral conductivity, 464.
Scudder, S. H., cockroaches from Carboniferous, noticed, 143.
Seaman, W. H., use of cyclosis in America, 469.
Sears, D., magnetism of soft iron, 21.
Seebach's, K. von, earthquake of March 6, 1872, *Emerson*, 455.
Seyberth, taurin not isethionamide, 61.
Shaw, changes in vegetation produced by sheep-grazing, 69.
Siebold, Anatomy of the Invertebrata, noticed, 146.
Silliman, B., tellurium ores of Colorado, 25.
Smith, J. L., warwickite, 432.
curious association of garnet, idocrase and datolite, 434.
volume of collected researches, noticed, 144, 240.
Smithsonian Report, noticed, 158.
Solar, see *Sun*.
Sound, analysis, *Mayer*, 170, 247.
reflection of, from flames and heated gases, *Mayer*, 362.
Spectrocope with fluorescent eyepiece, 64.
Spectrum of Coggia's comet, 156, 398.
solar, 136.
of zodiacal light, *Wright*, 39.
Stars, fixed, number and distribution of, *Gould*, 325.
Stefan, apparent adhesion, 137.
Stone, W. H., pressure required to sound wind instruments, 384.
Stromboli, mechanism of, *Mallet*, 200.
Sun, apparent diameter, periodic changes in, *Newcomb* and *Holden*, 268.
and atmospheric ozone, 477.
spots and rainfall, *Brocklesby*, 439.
spectrum of, 136.

T

Taurin not isethionamide, 61.
Tellurium ores in Colorado, *Silliman*, 25.
Terquem and *Trannin*, index of refraction of liquids, 386.
Thallium, compounds with alcohol-radicals, 60.

Thayer, A. S., polarization of plates of condensers, 208.
Thenard, P. and *A.*, condensation of acetylene by silent electric discharge, 61.
Tietjen, Coggia's comet, 78.
Troost and *Hautefeuille*, alloys of hydrogenium, 132.
Trowbridge, J., molecular change by electrical currents through iron and steel bars, 18.
Tschermak, G., Mineralogische Mittheilungen, noticed, 393.
Tuscarora soundings, 234.

U

Undulation, velocity of primitive, *Chase*, 366.

V

Vanilline, 384.
Vibrations, optical method of studying, *Rood*, 126.
Volcanic energy. *Mallet*, 140.
Volcano, mechanism of Stromboli, *Mallet*, 200.
Volcanoes, note on Hawaiian, 467.

W

Wanklyn, J. A., milk analyses, noticed, 140.
Water of crystallization, molecular volume of, *Clarke*, 428.
Weather maps, results from examination of, *Loomis*, 1.
Wiedemann, specific heat of gases. 465.
Weiser, R., permanent ice in mine in Rocky Mts., 477.
Wheeler, G. M., topographical atlas, noticed, 80.
White, C. A., Anomalodonta identical with Megaptera, 218.
Williamson, W. C., primeval vegetation and evolution, noticed, 150.
Willis, O. H., catalogue of plants, noticed, 71.
Wilson, A., statue of, 322.
Wind instruments, pressure required to sound, 384.
Wind, velocity of, and barometric gradient, *Ferrel*, 343.
Winchell, A., Doctrine of Evolution, noticed, 74.
Wing, M. E., Aurora at West Charlotte, Vermont, 157.
Wisconsin Academy, Transactions, noticed, 404.
Wright, A. W., spectrum of the zodiacal light, 39.
polariscopic observations of Coggia's comet, 156.

Y

Yates, L. G., fossil elephant and mastodon in California, 143.

Z

Zodiacal light, spectrum of, *Wright*, 39.
ZOOLOGY—
Brain in Tertiary mammals, *Marsh*, 66.
Coral reefs, notes on Darwin's work, *Dana*, 312.
of Hawaii, 466.
Difflugia, enemies of, *Leidy*, 223.
Embryology, notice of Kowalevsky's papers, 470.
of Ctenophoræ, 471.
Fishes, from Bermuda, *Goode*, 123.
Gastræa theory, 472.
Mollusca, distribution of, in Bahamas, 231.
Rat, habits of, *Chase*, 73.
Rhizopods, new fresh water, 224.
Rotifer, revivification of, 223.
Tortoises of Mauritius related to those of Galapagos, 403.
See further under GEOLOGY.